BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 96-1,	)	
	)	
Olympic Pipe Line Company	)	EXHIBIT ___
	)	
Cross Cascade Pipeline Project	)	
	)	
	)	

APPLICANT'S PREFILED DIRECT TESTIMONY

WITNESS #2: CLAUDE W. HARSHBARGER

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Q. Please state your name and employment position.

A. My name is Claude W. Harshbarger. I am the project manager for the Cross-Cascade Pipeline Project of Olympic Pipe Line Company ("Olympic"). My business address is 249 Main Avenue, Suite D, North Bend, Washington 98045.

Q. What is your educational and employment background?

A. I received my Bachelor of Science degree in Electrical Engineering from Texas A&M University in 1972. During college, I worked part-time for The Texas Pipe Line Company, a subsidiary of Texaco Inc. Upon graduation in 1972, I became a full-time engineer with The Texas Pipe Line Company in the Houston Division office. I was responsible for the detailed design and construction of pipelines.

In 1975, I was promoted to Coordinator - Maintenance, reporting to the Vice President at the Houston headquarters. I was responsible for the coordination of maintenance and corrosion for The Texas Pipe Line Company.

In 1976, I was promoted to the Traffic Division and served as Coordinator - Measurements. My responsibilities included the measurements of refined product and crude, quality issues, and dispatching.

In 1978, I was promoted to the Engineering Division as Supervising Engineer - Projects. I was responsible for the performance of a group of engineers. I was thereafter promoted to assistant manager of the engineering Division, responsible for the performance of all supervisors and their engineers. I was then promoted to manager of the Engineering Division, responsible for the performance of all assistant managers, supervisors and

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engineers.

In 1987, as a result of merging The Texas Pipe Line Company with Getty Trading and Transportation, I assumed the position of regional engineering manager for the Southern region, with responsibility for specific projects, coordination of operations, and special joint ventures with other companies.

During the summer of 1997, I was transferred to the Pacific Northwest and my present position as the Project Manager of the Cross-Cascade Pipeline Project.

Q. Generally, what type of experience have you had concerning the business of pipelines in these various positions?

A. Since 1978, I have had extensive experience in the coordination, design, construction and operation of pipeline projects. I have been closely involved in over one hundred major pipeline projects, and literally hundreds of specialty projects. This wide variety of experience has included the construction, design, engineering, expansion, revision, upgrading, retrofitting, maintaining and operation of pipelines. My pipeline work has included chemical product lines, refined product lines, crude lines, onshore lines, offshore lines, foreign lines, and domestic lines. I have experience in dealing with many types of geographic terrain, including wetlands, marshes, mountains, rivers, and agricultural lands.

Q. Have you also been involved with any industry organizations?

A. Yes. I have significant experience with the American Petroleum Institute, which sets the standards for the petroleum industry. I have served on numerous committees, including the Measurement, Corrosion, Design & Construction, Operation and Central Committees.

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I am familiar with various state and federal regulations concerning the design, construction and operation of pipelines. I am also knowledgeable regarding the state of the art for current pipeline technology.

Q. What topics will your direct testimony cover?

A. My direct testimony is intended to address the following topics:

First, I will explain the staffing of the Cross Cascade Pipeline Project.

Second, I will describe the principal features and components of the project.

Third, I will describe the proposed pipeline route.

Fourth, I will describe why the proposed route was selected.

Finally, I will explain generally our proposed construction methodology.

Q. How is the Cross-Cascade Pipeline Project staffed?

A. I replaced Alan Sanstra, who was the prior project manager and who retired in 1997. He remains, however, available to consult regarding project issues. Our current staff includes the following individuals:

- William Mulkey - Regulatory Affairs from Olympic Pipe Line Company;
- Keith Edwards - Engineer Supervisor from Texaco Pipeline Inc.;
- John Teriet - Right of Way Supervisor from Texaco Pipeline Inc.;

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- Gordon Eastling - Engineer from Marmac Engineers;
- Thomas Burton - Marmac Draftsperson;
- Wayne Messere - Marmac Draftsperson;
- Mike Mercer - Right of Way Field Agent;
- George Volimas - Right of Way Field Agent; and
- Lamar Hinze - Right of Way Field Agent.

We also have available for consulting four former project team members who have transferred to other projects:

- Jerry Lynch, Texaco Pipeline Engineer;
- Wayne Waterman, Texaco Pipeline Right of Way Supervisor;
- Scott Hinze - Texaco Pipeline Right of Way Field Agent; and
- Steve Bender, Texaco Pipeline Engineer.

We have also retained certain independent consultants to assist in connection with the project:

- Dames & Moore, Environmental Consultants;
- Marmac Engineering, Engineers;
- Bogle & Gates PLLC, Attorneys;
- Orion Associates, Public Relations;
- Geo Engineers Geologists and Engineers; and
- Goldsmith & Associates, Surveyors.

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Q. Please describe the Cross Cascade Pipeline Project.

A. In summary, the proposed Cross Cascade Pipeline Project includes a 231-mile underground pipeline, six pump stations, a storage and truck distribution terminal at the City of Kittitas, and a delivery facility at the terminus of the pipeline at the existing Northwest Terminaling Facility at Pasco. The pipeline will cross six counties (Snohomish, King, Kittitas, Grant, Adams and Franklin), and four cities (Snoqualmie, North Bend, Kittitas and Pasco). Attached hereto as Exhibit A is a diagram of the proposed route.

Olympic has designed the proposed pipeline, terminal, pump station and related facilities to be in compliance with all relevant federal and state regulations; to avoid, minimize and mitigate environmental impacts; and to utilize state of the art technology relating to pipeline projects of this kind. The design of the proposed project is discussed in detail in Part 2 of the revised application. In addition, topics such as pipeline and facility design, spill prevention and control, and safety compliance will be addressed in more detail in the testimony of Katy Chaney and William Mulkey.

Q. How does the proposed route proceed in Western Washington?

A. The proposed route commences near Thrasher's Corner in Snohomish County, where it will connect with Olympic's existing north-south pipeline system. The initial line will be 14 inches in diameter. A pump station will be constructed here, and the new pipeline will be located within an existing Bonneville Power Administration ("BPA") corridor.

The proposed route will then travel east, crossing the Snoqualmie River on an existing bridge, and then proceed southeast on existing rights of way, trails and roads. A second

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pump station will be constructed in North Bend. The proposed route will then cross Snoqualmie Pass using the railroad tunnel and continue southeast on existing rights of way.

Q. How does the proposed route proceed in Central Washington?

A. The proposed route will then cross under I-90 near the Indian John Hill Rest Area and then proceed across the Yakima River. The proposed route will then travel on existing rights of way north of Ellensburg and continue south to Kittitas.

A storage and distribution facility will be constructed at Kittitas adjacent to I-90 where two existing gasoline service stations are located. The Kittitas terminal will provide storage for inventory as well as in-transit deliveries to support tanker trucks servicing Central Washington. The Kittitas terminal will include ten storage tanks, plus necessary valves and piping, surrounded by containment dikes. In addition, a pump station will be included to move product in the line to Pasco. Two major product loading bays, one utility loading and unloading bay, loading and unloading pumps, an oil-water separator, and a vapor recovery unit will be included in the truck loading and unloading area. The Kittitas terminal will have an integrated fire safety/protection and monitoring system with alarms both locally and remotely at Olympic's Renton Control Center.

Q. Does the 14-inch line change at Kittitas?

A. Yes. When the pipeline leaves the Kittitas terminal, it will be a 12-inch diameter line.

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Q. How does the proposed route then proceed to Eastern Washington?

A. The proposed route will then travel east and southeast, crossing under I-90 near Vantage. The proposed route will then proceed south, parallel with the Columbia River, crossing the Columbia River by directional drilling near Wanapum Dam. After crossing the Columbia, the proposed route will continue east near Othello and then south to Pasco.

Q. What is the product capacity of the proposed pipeline?

A. The initial capacity of the proposed pipeline with three pump stations would be approximately 60,000 barrels per day of product. The maximum design capacity of the system is 110,000 barrels per day, which would require the future construction of three additional pump stations.

Q. Has the proposed route changed over time?

A. Application 96-1 was filed with EFSEC in February 1996. Since that time, Olympic has consulted with landowners, agencies, jurisdictions, intervenors and the public regarding questions and issues regarding the proposed route. On May 11, 1998, Olympic submitted a revised application which included route changes responsive to the concerns of landowners and agencies, and consistent with avoiding or minimizing impacts to wetlands and other environmental features. For example, through this process we have reduced the total acreage of temporary wetland impact from 23 acres in 1996 to 17 acres under the current revised application.

Olympic considered many variables when making a final decision on the proposed pipeline route. The principal criteria were as follows:

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- Length of pipeline as a cost factor for both construction and operation;
- Elevation profile and pipeline hydraulics:
- Constructability;
- Pipeline access;
- Environmental impact; and
- Ownership/land use.

Each of these factors plays an important role in determining the overall feasibility and efficiency of a proposed route.

The cost of construction and operation of a pipeline is dependent upon its length. Increasing the length of a pipeline route directly increases the amount of materials and labor that must be utilized. Pipelines may need more pump stations or an increase in the diameter of the pipe in order the compensate for additional frictional losses. Each of these items adds to the pipeline's construction cost. For instance, the construction cost for a 12-inch or 14-inch pipeline on generally level terrain is approximately $430,000 per mile. The estimated cost of each pump station is approximately $2 million. Enlarging a pipeline by one standard diameter costs approximately $32,000 per mile.

With respect to elevation and hydraulics, increasing the total elevation gain of a route or increasing the number of elevation gains and losses both results in an increase in the length of a pipeline's route and often causes an increase in the number of pump stations that are required. This too increases the construction costs.

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Constructability refers to the engineering difficulty and construction costs relative to the topography and geology of a route. Costs of construction are significantly higher for steep and rugged terrain. Large rock outcroppings, narrow rights of way, water bodies and steep slopes can add significant costs as well. On the other hand, the shortest and most level distance between two points may not always present a feasible route if there are other significant obstacles to construction.

Pipeline access refers to the feasibility for regular and ongoing maintenance activities when selecting a right of way. It is critical that the chosen pipeline corridor provides easy access at valve and pump station locations, as well as easy access to the line itself.

Environmental impacts refers to the selection of a route which should, to the greatest extent possible, avoid significant adverse environmental impacts. Wetlands, stream crossings, sensitive plant and animal species, and important habitats are all given careful analysis. Selecting a route that includes significant existing right of way can also minimize overall impacts to the environment.

Ownership/land use refers to the overall time and expense of acquiring rights of way for a proposed pipeline route. Construction in highly developed areas is expensive and often involves significant landowner issues. Minimizing the overall impact to landowners is an important consideration in the selection of a proposed route. Utilization of existing corridors, land that is devoted to grazing as opposed to highly developed agriculture, unproductive land, or large parcels that are held under single ownership are important factors to consider.

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Q. What specific route alternatives were considered?

A. Olympic considered six alternative cross-state routes and one sub-route for the pipeline. These include the following:

- Thrashers Corner (the proposed route set forth in the application);
- The Snohomish Alternative (Stevens Pass);
- The Allen Station Alternative (Stevens Pass);
- The Centennial Trail Alternative (Snoqualmie Pass);
- The Hollywood Alternative (Snoqualmie Pass);
- The Stampede Pass Alternative; and
- The Yakima Valley Sub-Corridor Alternative.

Q. Why was the Thrasher's Corner route selected as the proposed route?

A. The Thrasher's Corner route was selected because it satisfied, to the greatest extent possible, the route criteria discussed above. The proposed route presented the least amount of environmental impacts and, of those impacts, the most minimal environmental impacts. It is the most feasible to construct, and it is less expensive to construct than the other alternatives.

Q. Why were the two alternatives that cross Stevens Pass rejected?

A. Both the Snohomish Alternative and the Allen Station Alternative would commence in Skagit County and would proceed with Highway 2 over Stevens Pass to Wenatchee, then cross the Columbia River and terminate at Moses Lake. The existing pipeline from Spokane to Moses Lake would then be reversed or a parallel line constructed in order to make deliveries. These alternatives would be in the range of 45 to 60 miles longer than the other corridors and cost a minimum of $20 - 28 million more to construct. Stevens

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Pass is a much more rugged corridor with rock outcroppings and steep slopes, thus adding to the construction difficulty and the increase in construction costs. In addition, these alternatives would require crossing through seven cities with consequent construction impacts. For these reasons, both the Allen Station and Snohomish Alternatives were rejected when compared to the Thrasher's Corner route.

Q. Why were the other two alternatives that cross Snoqualmie Pass rejected?

A. In addition to Thrasher's Corner, two other alternatives were considered for crossing Snoqualmie Pass. The Centennial Trail Alternative was considered, but it would be nearly 20 miles longer and would cost approximately $10 million more in construction costs. The Centennial Trail Alternative also presented the unavoidable impact of filling high quality wetlands. The Hollywood Alternative would require two additional pump stations at an additional construction cost of nearly $4 million. The Hollywood Alternative would also require placing the pipeline in the City of Seattle Tolt River water pipeline corridor. Because the City has indicated plans to add a second water pipeline in this corridor, there is not sufficient capacity for the Cross-Cascade pipeline. For these reasons, the Centennial Trail and Hollywood Alternatives were rejected in favor of the Thrasher's Corner route.

Q. Why was the alternative that crosses Stampede Pass rejected?

A. One alternative required crossing Stampede Pass. The Stampede Pass Alternative was rejected because it was considered to be less feasible to construct than any of the Snoqualmie Pass alternatives, pipeline access for monitoring and maintenance would be more remote, and construction would be required in the Cedar River Watershed. For

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these reasons, the Thrasher's Corner route was proposed over the Stampede Pass alternative.

Q. Why was the Yakima sub-corridor alternative rejected?

A. Olympic considered a Yakima alternative which would require proceeding south from Ellensburg through Yakima, Grandview, and then on to Pasco. While this Yakima Valley alternative could be used with any three mountain pass crossings, the environmental impacts were assessed to be greater than the Thrasher's Corner route. The Yakima Valley Alternative would require crossing the Yakima River a minimum of six times as compared to one crossing for the Thrasher's Corner route. This would increase the construction costs by at least $5 million. In addition, the Yakima Valley Alternative requires crossing through vineyards, orchards and croplands. Thus, the construction impacts would be greater than the Thrasher's Corner route.

For all of these reasons, the Thrasher's Corner route was selected over the other five alternatives.

Q. Who will be responsible for construction on behalf of Olympic?

A. My responsibilities as project manager include the ultimate construction of the Cross-Cascade pipeline and its related facilities. A construction company has not yet been selected. We would solicit bids from qualified pipeline contractors who have experience in projects of related magnitude. In order to ensure that construction proceeds in a timely manner, we will likely engage three major pipeline contractors, and multiple other contractors for pump stations, terminals, road crossings, river crossings and other specialized projects.

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The construction activities of the proposed pipeline are addressed in detail in Section 2.12 of the application. It is anticipated that the duration of construction will be approximately ten months. Peak employment during construction will include as many as 950 personnel.

It is anticipated that construction will be accomplished in three pipeline "spreads." A "spread" is a coordinated construction crew which includes the equipment necessary to complete entire sections of pipeline installation. One spread will be designated to work from the western origination point and another from the eastern terminus, both proceeding to the middle. Each of those two spreads will install between 10,000 and 12,000 feet of pipe per day. The third spread will work in mountain terrain and narrow rights of way from approximately east of Snoqualmie to Lake Keechelus. It is anticipated that this spread will install approximately 2,000 feet of pipeline per day. Each spread will proceed generally in the following sequence:

- Surveying
- Fence and erosion control
- Grading
- Ditching
- Pipe stringing
- Bending
- Pipegang (lineup, weld root and hot passes)
- Firing line (Complete weld with filler and cap passes)
- Tie in
- Radiography (x-ray)
- Weld repair

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- Joint coating
- Pipe lowering in
- Back fill and cathodic protection
- Road and railroad crossings
- River, stream and canal crossing
- Pipe cleaning and hydrostatic testing
- Cleanup, restoration and revegetation
- As built surveying

Q. Do you have a plan for making sure that construction complies with all conditions imposed by EFSEC?

A. Yes. We must ensure that construction proceeds in strict compliance with all of the conditions imposed under EFSEC's certification of this project. To guarantee compliance, we will engage both independent inspectors and company inspectors, between 50 and 100, to ensure compliance with the certification conditions.

END OF DIRECT TESTIMONY

I declare under penalty of perjury that the above testimony is true and correct to the best of my knowledge. Executed this _____ day of September, 1998.

_____
Claude W. Harshbarger

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